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EDITORIAL

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VETERINARIANS AND PUBLIC HEALTH

Diabetes Scenario Today is Seemed to be a Created Epidemics

> ***"Western Human Medicine is not true science. It is just statistical science where averages of all measurements are converted into normals. When one converts averages into normals, one generates 5-25% false positives. Today the diagnosis has become a disease in itself. We can create epidemics where none existed,"***
>
> **- Prof. Dr B.M. Hegde**

Veterinarians are more closely associated with diabetes at least when the sole source of insulin was animals, some 20-25 years ago. The name "diabetes" has now become a trendy term not only among progressive public and palliative patients, but also among practicing physicians. There are also lots of confrontations of various terminologies used for this disease. The old conventional terms "Insulin Dependent Diabetes" (IDD) and "Non-insulin Dependent Diabetes" (NIDD) are not followed now because they have frequently resulted in classifying the patients based on treatment rather than etiology. Then came the terms Type I (IDD) and Type II (NIDD) which were also not officially followed because the Roman numerical I and II can wrongly be confused as the Acute Type I leading on to the Chronic Type II. The approved terminology as on date is Diabetes Type 1 for IDD and Diabetes Type 2 (NIDD) with Arabic numerical to show the discontinuity between 1 & 2. To make the confusing matters worst, some doctors smartly use "Insulin Resistance" to Type 2 diabetes which is again wrongly construed as the one similar to "Antibiotic Resistance" meaning wrongly that continous treatment of diabetes with insulin may lead on to Type 2.

Strictly and correctly speaking "Hyperglycemia" is a misnormer. Scientifically, diabetes Type 1 is "Intracellular Hypoglycemia" due to endogenous insulin deficiency, which is indirectly diagnosed by hyperglycemia in the extracellular fluid either as plasma glucose or serum glucose.

Management or control of any disease in general and diseases of human in particular, is initiated after diagnosis of the disease. If the diagnosis of the disease is positive and correct, treatment will be initiated easily and directly. Even if the diagnosis is not possible or diagnosis is false – either false positive or false negative, palliative treatment on the basis of symptoms is possible. In any case, the worst situation could be a failure of the control of the disease. But in the case of diabetes, a wrong diagnosis of Type 1 diabetes if started with insulin treatment, it will induce immunogenic anti-insulin response either through humoral anti-insulin antibody or through cell mediated anti-insulin response or both causing a serious destruction of insulin secreting cells. This danger did not happen in those days when insulin from animal source was used because such insulin was more homologous to human system. But present day insulin are cloned antigens and so are more heterologous that they are recognized as foreign antigen and stimulated as vaccine response.

Like Indian pharmacopeia, there is no Indian standards for blood glucose level for diabetic diagnosis. To quote Prof. B.M. Hegde's (a cardiologist & former vice-chancellor) opinion (Indian Exp. Dtd. 06.09.2016). "*Western Human Medicine is not true science. It is just statistical science where averages of all measurements are converted into normals. When one converts averages into normals, one generates 5-25% false positives. Today the diagnosis has become a disease in itself. We can create epidemics where none existed,*" I feel the present day diabetic scenario of India is seemed to be a created epidemics.

If the following questions are scientifically or even logically addressed, at least a rethinking on this topic may originate among us.

- The so called pathology of diabetes is due to the mere presence of high glucose in the blood or low /nil glucose inside the millions of cells of the body …?
- The very nomenclature of classification of diabetes i.e Type 1 or Type 2 is so badly dependent on the basis of treatment and not by Etiology… why…?
- Why laboratory assessment of "Endogenous Insulin" is not followed in any protocol of initial diagnosis of diabetes…?
- The presence of glucose in blood is whether a "*normal constituent*" or a "*pathological metabolite*".
- Why or how the 120 mg/Dl was decided to be the cut off level for diabetic diagnosis…?
- In OGTT – Oral Glucose Tolerance Test – till now approved and followed test protocol for diagnosis of diabetes – 75 g of glucose is seemed to be dangerously high because 75 g of glucose is approx. equivalent to 75 x 6 = 450 g of boiledrice or 75 x 3 = 225 g of boiled cereal – any of which is normally impossible to take as a single meal by anybody. How can this be a reasonable test …?

As human beings, we have our bodies, which are but the illusion of our mind, our worries and anxieties, our social and environmental factors, our economic and social status, and above all, our religious beliefs which could collectively and severally affect our personality as a patient. The best doctor to know all these would be our family doctor.

The last class knows more and more about less and less. This tendency to diagnose and treat patients with a tinted glass of reductionism has become the bane of western medicine today. In more advanced set ups, the patient is hardly listened to or examined physically. The symptoms direct the huge list of investigations and from then on, the specialist treats only the reports and NOT the poor sick human being resulting in much misery and economic loss to the patient. It is usually outsiders who spot these lacunae in any system and think outside the box.

Young veterinary researchers of physiology, biochemistry and biotechnology can address these questions because veterinary preventive medicine is not only for zoonosis but also for public health like this and think outside the box.

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Effect of Using Oestrus or Non-Oestrus Teaser Cows on Ejaculation Time and Cortisol Level in Blood of Madura Bulls During Semen Collection

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Abstract

Ejaculation time was measured when semen collection was done and blood samples were estimated using Indirect ELISA for determining the effect of using oestrus and non oestrus teaser cow on ejaculation time and blood cortisol levels as an indicator of stress of Madura bulls in Madura, Indonesia. The ejaculation time differed significantly ($p < 0.05$) between using teaser cow in oestrus (1.975 ± 0.499 minutes) and non-oestrus (2.994 ± 0.528 minutes). There was no significant difference between cortisol level of bulls when using teaser cow in oestrus (11.920 ± 4.169 ng/ml) and non-oestrus (9.803 ± 4.989 ng/ml) during semen collection.

Key words: Madura bull, oestrus cow, ejaculation time, cortisol

Bulls with superior semen quality is one of the important keys of successful breeding program. Proper semen collection process including the use of teaser cow is expected to influence the quality of the semen. Handling procedures for farm animals were presumed to be related to stress (Borell, 2001). During this time, stress in animals can be known by measuring levels of cortisol in blood, urine, saliva, hair, faeces, and milk (Chen *et al*, 2015).

Materials and Methods

Eight Madura bulls of Technical Implementation Unit of Livestock Breeding and Forage of Animal Feed in Madura (UPT Madura), East Java Livestock Services, Indonesia were used for sample collection. The stages of the estrous of teaser cows were determined by rectal palpation. The animals were fed with usual diet and water was available *ad libitum*.

Ejaculation time was measured from the time bulls began sniffing until ejaculation occurred. Blood samples were collected from jugular vein of bulls, 15 minutes after ejaculation. Serum was stored in the freezer at -20 °C, until assay of the sample was done by Indirect ELISA Technique.

Results and Discussion

Based on the test result by using independent t-test, there was a significant difference ($P < 0.05$) between the usage of oestrus and non-oestrus teaser cows. It can be seen that ejaculation time using oestrus cows was shorter than using non-oestrus cow (Table I).

The oestrus females release pheromones which in cows, signalling is seen in pre-oestrus and oestrus phases. Pheromones in the form of trimethylamine, acetic acid, phenol 4-propyl and propionic acid present in cattle saliva will provide a special signal for the bulls (Sankar *et al*., 2007). Bioassay of faeces sample showed that acetic acid, propionic acid and 1-iodo undec-

Table I. Independent t-test for ejaculation time

	Group	Mean	SE	t	p
Ejaculation Time	Oestrus Teaser Cow	1.975[a]	0.499	-3.96	0.001
	Non Oestrus Teaser Cow	2.994[b]	0.528		

Values with different superscripts differ significantly (P<0.05).

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Table II. Independent t-test for blood cortisol level

	Group	Mean	SE	t	p
Blood Cortisol Level	Oestrus Teaser Cow	11.920	4.169	0.921	0.373
	Non Oestrus Teaser Cow	9.803	4.989		

ane were present in the oestrus phase, while the compounds of butanoic acid, 2-propenyl ester, carboxylic acid and pentanoic acid were found only in pre-oestrus. In addition, 3-hexanol, butane, 2,2-dimethyl and phosphonic acid were found exclusively in post-oestrus phase (Sankar and Archuman, 2008), while 1-iodo undecane is a pheromone that could be found in the urine of oestrus cow (Archunan and Rameshkumar, 2012).

Bulls may mark the oestrus cows with stimulation through two chemosensory systems. The main olfactory system (MOS) and the vomeronasal system (VNS) are responsible for the perception of odorants in mammals. The MOS is considered to be responsible for recognizing the conventional volatile odorant molecules, whereas the VNS is thought to be tuned for sensing pheromones. Both chemosensory systems, together with additional olfactory organs, are involved in pheromone detection (Mucignat-Caretta *et al*., 2012 ;Tirindelli *et al*., 2009). The teaser oestrus cow makes attractive response for mating and shorten the ejaculation time of the bull. As in this study it was proved that the use of oestrus teaser cow will shorten the ejaculation time.

Based on independent t-test, there was no significant difference ($P < 0.05$) between the different teaser cows. It can be seen that the levels of cortisol in the blood as an indication of stress did not show differences when using teaser cow with oestrus and non-oestrus cows during semen collection process (Table II).

Cortisol levels in normal condition of animals are regulated and limited by a negative feedback system in the hypothalamus. Feedback system does not occur in stress condition. Corticotropic Releasing Factor (CRF) or Corticotropic Releasing Hormone (CRH) is the main hormone that regulates animal response to stress. All forms of stress, whether physical, chemical, temperature, microbial and other factors have a profound effect that stimulates the hypothalamus secreting CRH which will disrupt the diurnal and nocturnal rhythms in the regulation of cortisol levels (Martin and Crump, 2003). Normal levels of plasma cortisol in healthy cows are 6.74 to 56.30 nmol / L or 2.44 to 20.38 ng / ml (Proverbio *et al*., 2013). Cortisol levels will peak in 15-20 minutes after stress and will return to basal concentrations after 1 hour (Lay *et al*., 1998).

Summary

The results of this study indicated that there was no increase in cortisol levels when teaser cow with oestrus and non-oestrus were used for semen collection process of Madura bulls. The process of semen collection did not induce stress in Madura bulls. This is in accordance with the indication that Madura cattle are more resistant to stress.

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